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Teacher-Nonteacher Pay Differences in Côte d'Ivoire

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Although teachers in Côte d'Ivoire receive a rent component in their base salaries, it does not put them ahead of nonteachers, who are likely to receive better in-kind benefits, bonuses, and commissions in addition to their salaries.

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Because base salaries for teachers in Côte d'Ivoire are higher than wages of workers in other occupations, there is some question about whether teachers are overpaid. But other workers widely receive benefits, bonuses, and commissions and earn the same as teachers. Even allowing for higher educational requirements, different types of teachers, and longer vacations, teachers are not better paid than employees in other fields.

Moreover, while salaries for teachers and other workers having similar educational backgrounds in Côte d'Ivoire are almost the same, nonteachers earn twice as much as teachers having similar lengths of service.

Policymakers should thus be cautious when considering budget cuts that would lower teachers' salaries, cuts certain to make the teaching profession less attractive.

This paper is a product of the Education and Employment Division, Population and Human Resources Department. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Rita Vartamian, room J6011, extension 34678.

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I. INTRODUCTION.

The education sector in Cote d'Ivoire accounts for over 40% of the government's recurrent budget. This is the highest share of any country in the world. Within the education budget, teacher salaries are the single most important component, representing almost 60% of outlays. In 1977, teachers in Cote d'Ivoire were the first group within the civil service to obtain the uncoupling of their salary schedule from the general civil service schedules. Subsequently, they received tremendous increases in salaries. Although since then other occupations were granted the same benefit (judges, military and police personnel, etc.), teachers are still viewed as the symbol of the policy of "uncoupling". It is not surprising therefore that in the current period of economic recession in Cote d'Ivoire and the subsequent far-reaching measures of macroeconomic stabilization and adjustment, the share of salaries in the education budget, as well as the share of the latter in the overall budget, have come under increasing scrutiny. The question has been raised whether teachers are "overpaid" and whether consequently there is scope to reduce teacher salaries without endangering an adequate supply of teachers. This paper provides empirical evidence towards answering this question by analyzing whether teacher salaries contain an economic rent component and whether the returns to education and experience are higher for teachers than for other occupations.

The general issue of compensation differences between members of different professions has received extensive attention in the labor economics literature, usually in the context of an analysis of segmentation or discrimination, but little of it has focused on teacher salaries. A recent study by Psacharopoulos (1987) concluded that there is no evidence

of teachers being overpaid in Brazil. For Cote d'Ivoire, a study by Bourguignon (1986) using a job rationing approach concluded that reducing teacher salaries would result in a shortage of teachers.

II. THE MODEL.

This paper uses a monthly wage rate function, which explicitly recognizes that differences in salaries can be due to differences in both human capital and other personal characteristics of workers. The model is as follows:

$$LnY_i = F(S_i, E_i, E_i^2, D_i; LnH_i; Z_i, T_i)$$

Where Y_i is the monthly earnings of individual i.

The first group of explanatory variables are the standard human capital variables:

S = number of years of schooling,
E = number of years of current and previous job experience,
D = a dummy variable equal to 1 if a diploma has been obtained, zero otherwise.

In the model, experience is often interpreted as on-the-job training, as opposed to formal training. Its square is also introduced to capture decreasing marginal returns to experience. The diploma variable will capture the possibility of remuneration being based to a certain extent on the formal credentials of the worker.

The equation also controls for the number of hours (H) actually worked during the month, because there can be important differences between occupations, especially between teachers and others.(1)

The last group of explanatory variables consist of a set of personal attributes (Z) and a dummy variable (T) to indicate if the individual is a teacher. A positive significant coefficient of T would indicate the presence of a salary premium, going to teachers, relative to

other professions. This salary premium is likely to constitute an economic rent in view of the restricted entry into the teaching profession. No primary school teacher can be hired by the Government if he/she has not been trained in one of the teacher training centers (CAFOPs), and entry into CAFOPs is controlled by the Government. There are also to some extent barriers to entry at the secondary level because graduates of the public secondary level teacher training schools (ENS and IPNETP) are hired preferentially by the Government. Moreover, there is only a limited number of private schools where teachers can find jobs outside Government (Government licenses are required to operate these schools). Lastly, the teaching profession is certainly the most unionized profession in the country, which gives it an almost unique bargaining power.

An alternative to the method discussed above would be to compare salaries of teachers with those of selected comparable occupations, whereby the criterion for selection would be a matching level of required education. Although this may result in more closely matched control groups, the drawback of this approach is that the control groups themselves may be subject to rent (positive or negative), which would distort the results.

III. THE DATA.

The data for this study come from the 1985 Cote d'Ivoire Living Standards Survey, which canvassed a nationally representative sample of 1600 households. Information was collected on a wide array of subjects, including income, expenditures, assets, employment, and socio-economic characteristics of the household and its members (for a further description of the data content and questionnaire of the survey, see Grootaert, 1986; the survey's data collection procedures are discussed in Ainsworth and

Munoz, 1986). A subsample of individuals employed in the private and public sector, and having received at least 6 years of schooling has been drawn from this database. This subsample provides a meaningful control group to teachers. The subsample was limited to wage-earners for two reasons. First, earnings of the self-employed reflect returns to capital as well as labor which makes them in principle uncomparable to wage-earnings. Second, the inclusion of self-employed in the control group would add a selectivity problem.

Table I presents summary statistics of selected variables. It reveals that there is little difference between the teacher and the non-teacher groups with respect to sex, age, experience, and nationality. Notable differences can be observed, however, for the location of employment; most non-teachers work in Abidjan (60%) while only 30% of the teachers are employed in this city. This reflects that schools in Cote d'Ivoire are more evenly distributed across regions than firms and administrations.

The variables representing the education level show, as one would have expected, a significant difference between teachers and non-teachers: teachers are better educated both in terms of number of years of schooling and diplomas received. Twice as many teachers work for the Government than non-teachers. Teachers also receive about 50% more salary (before tax) than other occupations. At the same time, they work 60 hours less per month and enjoy 3 months of vacation per year, which is two more months than their non-teaching counterparts. Non-teachers, however, receive more in-kind benefits, such as transportation and housing allowances, as well as bonuses and commissions. (2)

Table I

MEANS AND STANDARD DEVIATIONS OF SELECTED VARIABLES

VARIABLES	TEACHERS	OTHERS	ALL
Monthly Base Salaries	194216	130737	141000
	(115384)	(125245)	(125735)
Monthly Benefits	18284	37826	34667
	(34080)	(73700)	(69193)
- Transportation	2517	11268	9853
- Housing	12416	12974	12883
- Commission	3170	12046	10611
- Other	182	1538	1319
Total Monthly Salaries	212500	168563	175666
	(138441)	(170973)	(166747)
Years of Schooling	12.80	9.57	10.09
	(3.57)	(3.53)	(3.73)
Earned Diploma? (yes=1)	1.00	0.93	0.95
	(0.0)	(0.25)	(0.23)
Experience	10.04	9.82	9.85
	(8.63)	(7.49)	(7.67)
Age	33.37	33.30	33.31
	(7.85)	(8.27)	(8.20)
Monthly Hours Worked	121.11	184.79	174.49
	(53.49)	(55.80)	(60.13)
Sex (Females=1)	0.26	0.20	0.21
	(0.44)	(0.40)	(0.41)
Work in Abidjan? (yes=1)	0.30	0.61	0.56
	(0.46)	(0.49)	(0.50)
Nationality (Ivorian=1)	0.93	0.95	0.94
	(0.26)	(0.23)	(0.23)
Work for Govt? (yes=1)	0.81	0.49	0.54
	(0.39)	(0.50)	(0.50)
Number of Observations	54	279	333

Standard deviations in parentheses.

IV. DO TEACHERS RECEIVE RENTS?.

Table 2 displays the regression results for the expanded earnings function. Two types of dependent variables were used in the analysis: earnings before tax, which best reflects workers' base salaries, and total earnings, which includes all benefits, bonuses, and commissions received by workers. This distinction is useful because increases in teacher base salaries have been made in Cote d'Ivoire independently from increases in other benefits. We also distinguish between government and non-government workers, because in Cote d'Ivoire the government plays a leading role in determining teachers salaries. Therefore, it is interesting to compare teachers' salaries with those of other employees in the government sector.

Table II

Regression Results

Dependent Variable Sample	(1) Base Salaries (All Wkers)	(2) Base Salaries (Gvt Wkers)	(3) Total Salaries (All Wkers)	(4) Total Salaries (Gvt Wkers)
Years of Schooling	0.1527* (14.13)	0.1206* (10.71)	0.1678* (14.8)	0.1362* (11.65)
Diploma	0.1451 (0.92)	0.7455* (2.76)	0.1228 (0.74)	0.5548* (1.98)
Experience	0.1058* (7.71)	0.0578* (4.06)	0.1151* (8.0)	0.0552* (3.73)
$Experience^2$	-0.0018* (-3.96)	-0.00068 (-1.52)	-0.002* (-4.1)	-0.0005 (-1.11)
Log of Mthly Hrs Worked	0.1501* (1.89)	0.0581 (0.7)	0.1302 (1.56)	0.1235 (1.43)
Work for Government (Yes=1)	0.0064 (0.079)	--- ---	-0.0224 (-0.26)	--- ---
Sex (Female=1)	-0.0780 (-0.90)	-0.3352* (-4.15)	-0.1782* (-1.95)	-0.4536* (-5.41)
Nationality (Ivorian=1)	0.1351 (0.68)	--- - -	0.1545 (0.96)	--- ---
Location (Abidjan=1)	-0.0126 (-0.17)	0.1274 (1.63)	-0.092 (-1.18)	0.054 (0.66)
Teacher (yes=1)	0.2048* (1.85)	0.2699* (2.79)	0.008 (0.07)	0.1027 (1.02)
Constant	8.157* (16.9)	8.83* (16.5)	8.33* (16.4)	8.78* (15.8)
R^2	0.5421	0.60	0.5468	0.6070
F	40.3	34.48	41.05	35.36
Number of Cases	333	179	333	179

T-values between parentheses.
* indicates statistically significant coefficient at 0.10 level.

The results reveal an interesting systematic pattern between government workers (Equations 2 and 4) and all workers (Equations 1 and 3). The returns to schooling are lower in the government sector than in the economy as a whole, but a large premium is paid in the government sector for having earned a degree; this suggests a strong presence of credentialism(3) in the government sector only. The impact of experience on earnings, on the other hand, is twice as high in the complete sample than in the government subsample. These observations can be easily explained by the more compressed distribution of earnings in the government sector than in the private sector and by the fact that productivity is not a major criterion of remuneration (if one at all) in the government sector. For example, the non-significant coefficient of experience-squared in the government subsample reflects the government's habit of granting workers fixed increases (about 6%) each year, regardless of amount of experience.

The monthly number of hours worked does not appear to be a strong determinant of earnings neither in the government nor in the total sample. The Z-variables included in the equation are generally not significant: no remuneration differences are apparent due to nationality or place of work. Government workers as such do not receive a premium over private sector workers. This is perhaps surprising in view of the differences in the way the two sectors reward human capital as we discussed above, but of course, it is not inherently inconsistent with this. The results in Table 2 do suggest remuneration differences between the sexes, ranging from 20 to 57% in favor of men (4).

However, as a recent study by Grootaert (1987) also based on the Cote d'Ivoire Living Standards Survey data has shown, sex is an important determinant of selection into different types of employment in Cote

d'Ivoire, and significant coefficients for sex in earnings functions results tend to disappear once the latter are corrected for selection bias. Studies by Komenan (1987 a and b) using establishment-based surveys (which are less heterogenous and exclude the civil service) consistently found no sex differences.

With respect to the central question of this paper, the estimations reveal quite clearly that when one considers earnings before tax (Equations 1 and 2), teachers do enjoy a substantial salary premium of 23 percent. In the government sector this premium is larger (31%), which suggests that the overall premium is largely due to the government sector. Had a separate estimation for the private sector been possible (it is not possible because the sample contains too few teachers in the private sector), the estimated premium for teachers would have been much lower there. However, when one considers the base salary augmented with the benefits received (Equations 3 and 4), the premium enjoyed by teachers vanishes completely. This is of course because teachers receive substantially less in-kind benefits and bonuses and commissions than their non-teaching counterparts (see table 1). This also suggests that teacher salaries may have been designed to compete with <u>total</u> salaries paid in the private sector, which necessitates a higher base salary for teachers. In conclusion, our results, so far, do not support the presence of an economic rent component in the total salaries of teachers in Cote d'Ivoire.

The use of an earnings function to establish this result implies two assumptions. First, it assumes that there are no differences in ability between teachers and non-teachers other than those captured by the variables in the equation. This follows from the standard assumption underlying all earnings function analysis, namely that there are no major "unmeasured" elements of human capital. Second, it is assumed that there

are no major differences in the direct education costs between teachers and non-teachers. If there were such differences, a higher salary for the high cost group could represent a compensation for this and not necessarily an economic rent. A study of vocational and technical training in Cote d'Ivoire has shown that the annual net out-of-pocket cost for teacher training was only 4% higher than for other technical training (Grootaert, 1987). Hence, the second assumption is valid.

Refining the Results.

An interesting question is whether the base-salary premium received by teachers in Cote d'Ivoire is the same in different parts of the country, and similarly, whether the absence of a premium in total salary is also found everywhere. To test for this, we replaced the teacher variable in the equation with interaction variables between teacher and location. The results in Table 3 show that the premium in basic teacher salary is slightly higher (the difference is not statistically significant) in other locations than in Abidjan and that in the private sector salaries of non-teachers in other locations tend to be higher than their counterparts' in Abidjan. This lends support to the interpretation we offered earlier that the premium in base salary serves to make total remuneration competitive with other professions. Indeed, given the attraction of the Abidjan metropolis and the high rates of immigration into it, a higher premium to private sector workers salaries outside Abidjan may well be necessary to recruit and retain them in rural areas and in cities other than Abidjan.

Table III

Regression Coefficients of Teacher-Location Interaction Dummy Variables

Dependent Variable Sample	(1) Base Salaries (All)	(2) Base Salaries (Govt)	(3) Total Salaries (All)	(4) Total Salaries (Govt)
Teachers in Abidjan	0.1874 (0.97)	0.2998* (1.73)	-0.0408 (-0.20)	0.1301 (0.72)
Teachers in Other Locations	0.2071* (1.65)	0.3148* (2.94)	-0.0128 (-0.10)	0.1149 (1.03)
Non-Teachers in Abidjan	-0.0116 (-0.15)	0.1587* (1.87)	-0.1013 (-1.22)	0.0624 (0.71)
Non-Teachers in Other Loc.	---	---	---	---

T-values between parentheses.
* indicates statistically significant coefficients at 0.10 level.

The sample underlying the estimation in Table 2 contains employees with at least six years of education. Currently, however, the minimum level of education required in Cote d'Ivoire to be a school teacher is 10 years. The teachers in the sample with less education could thus be seen as belonging to the "old generation" of teachers. In order to see whether they represent "abnormal" cases, we reestimated the earnings equation over the subsample of employees with at least 10 years of education. Table 4 reveals that the differential between teachers and other employees is essentially the same for that subsample as for the original subsample (the t-value for the difference between the coefficients in the two equations is below the critical value).

Table IV

Regression Coefficients of Teacher Dummy Variables According to Minimum Level of Schooling

Dependent Variable Sample	(1) Base Salaries (All)	(2) Base Salaries (Govt)	(3) Total Salaries (All)	(4) Total Salaries (Govt)
6 Years of Educ. or Higher	0.2048* (1.85)	0.2699* (2.79)	0.008 (0.01)	0.1027 (1.02)
10 Years of Educ. or Higher	0.1759 (1.38)	0.2980* (2.83)	-0.004 (-0.03)	0.1383 (1.29)

T-values between parentheses.
* indicates statistically significant coefficients at 0.10 level.

The results do confirm, however, that any premium received by teachers in their base salary results mostly from government wage setting behavior. However, when all benefits are included, the differential again disappears. We thus maintain the conclusion that teachers as a group, when considering their total earnings, are not better paid than other employees.

Two further aspects remain to be investigated. The first one concerns the total number of months worked per year by each group. We mentioned earlier that teachers enjoy three months of paid vacations versus one month for other employees. It may be argued this represents a de facto reduction of hours worked by teachers. Although the estimations have shown a time-worked elasticity of total earnings insignificantly different from zero, it is still worthwhile to account for the extra vacation by adjusting the average monthly hours worked accordingly. The results, however, were not significantly different from those in Table 2. (5)

The second aspect that remains to be investigated is whether the preceding results hold as well for any particular group of teachers (i.e. primary, secondary or higher education teachers). To that effect, we

selected all primary school teachers in the sample and pooled them with a subsample of non-teacher employees with 6 to 15 years of education -- the range of education corresponding to that of primary school teachers --who, hence, provide a meaningful control group. The results in the first line of Table 5 show that a salary premium for primary school teachers exists mainly in the public sector and that it disappears when total earnings are considered. In line with our earlier argument about teachers with less than 10 years of education, we also show the results for primary school teachers with 10 to 15 years of education. As in Table 4, the results suggest that the base salary premium is not significantly different between the two groups of teachers. Again, there is no evidence that primary school teachers receive rents when total remuneration is considered. (The lack of sufficient observations unfortunately did not allow to repeat this analysis for the other types of teachers.)

Table V

Regression Coefficients of Teacher Dummy Variables
For Primary School Teachers

Dependent Variable Sample	(1) Base Salaries (All)	(2) Base Salaries (Govt)	(3) Total Salaries (All)	(4) Total Salaries (Govt)
6-15 Years of Education	0.1037 (0.76)	0.2378* (1.91)	-0.1358 (-0.95)	0.0166 (0.13)
10-15 Years of Education	0.0786 (0.45)	0.3032* (2.07)	-0.1711 (-0.94)	0.0753 (0.52)

T-values between parentheses.
* indicates a statistically significant regression coefficient.

VI. DO TEACHERS HAVE DIFFERENT EARNINGS PROFILES?

The previous section established that total salaries of teachers do not contain a premium i.e. a component that cannot be explained by differences in endowments of human capital or by other personal characteristics. This does not mean, however, that the returns to human capital, to both formal education and on-the-job training, are the same between teachers and non-teachers. To address that issue, we estimated the earnings equation separately for teachers and non-teachers (Table 6). The results show virtually identical returns to a year of schooling, but a return to experience initially twice as large for non-teachers as for teachers. This steeper earnings-experience profile for non-teachers only peaks after 30 years of experience.

Table VI

Regression Results

Dependent Variable	(1) Total Salaries Non-Teachers	(2) Total Salaries Teachers
Years of Schooling	0.1664*	0.1728*
	(13.17)	(6.82)
Diploma	0.1495	---- 1)
	(0.87)	----
Experience	0.1234*	0.0664*
	(7.73)	(2.20)
Experience^2	-0.002*	-0.0011
	(-3.81)	(-1.19)
Log of Mthly Hrs Worked	0.2064*	-0.0222
	(1.93)	(-0.21)
Work for Government (Yes=1)	-0.0683	0.2744
	(-0.74)	(1.31)
Sex (Female=1)	-0.2173*	0.0257
	(-2.07)	(0.17)
Citizenship (Ivorian=1)	0.1664	0.0550
	(0.90)	(0.18)
Location (Abidjan=1)	-0.0988	-0.2278
	(-1.15)	(-1.22)
Constant	7.8755*	9.2830*
	(12.61)	(13.63
R^2	0.54	0.54
F	37.66	8.78
Number of Cases	279	54

T-values between parentheses.
* Indicates statistically significant coefficients at the 0.10 level.
1) All teachers have diplomas.

The equations also confirm that hours worked is not a significant determinant of teacher salaries. For other occupations the elasticity of earnings with respect to hours worked is positive but small (a 10% increase of monthly hours is associated with only 2% salary increase). This is not surprising if one knows that all of teacher contracts and the majority of private employment contracts in Cote d'Ivoire set salary on a monthly basis and that hours worked is an important earnings determinant only for low-level workers.(5)

The splitting of the sample to estimate separate equations for teachers a. ' non-teachers assumes that there are no significant omitted variables which also determine the selection into the teaching profession. To test for the presence of possible selection bias, we applied Heckman's (1979) two-stage technique, whereby the first stage was a probit equation which explained occupation choice as a function of personal characteristics (human capital, sex, nationality, place of origin) and parental background. No evidence of selection bias was found.

VI. CONCLUSION.

This paper used multivariate analysis based on the monthly wage rate functions to investigate differences in earnings between teachers and other occupations in Cote d'Ivoire. The analysis controlled for differences in human capital endowments, hours worked, and various personal characteristics. It was found that the base salaries of teachers contain an economic rent component, largely due to the wage setting behavior of the Ivorian government. This salary premium is largest outside Abidjan. The premium disappears, however, when the total remuneration package is considered, i.e. including in-kind benefits, bonuses and commissions, which are more widely received by non-teachers.

These findings are consistent with those of Bourguignon (1986) for Cote d'Ivoire and with those of Psacharopoulos (1987) for Brazil. The conclusion was unchanged when allowance was made for the longer vacation time enjoyed by teachers, for the higher minimum education requirements recently applied to teachers in Cote d'Ivoire, and for the existence of different types of teachers. We also obtained that earnings-experience profiles for non-teachers are steeper than for teachers revealing that possibilities of earnings growth are more available to non-teachers than to teachers. Therefore, much caution should be observed when considering salary policy options in a context of budgetary restrictions in Cote d'Ivoire.

While our findings could be viewed as supporting a reduction in teachers' base salary and a reallocation within the total compensation package towards in-kind benefits, they do indicate that a cut in total earnings would make the teaching profession less attractive than others, from a strict salary point of view. (6) This conclusion is of course only valid given the current amount of human capital embodied in the average teacher, which as we have seen significantly exceeds that of other professions. The question whether the current entry requirements into the teaching profession in terms of years of education could not be lowered without jeopardizing the quality of teaching is an important topic for further investigation. Since the Cote d'Ivoire Living Standards data collection is ongoing we look forward to investigating this issue further on a larger database. Such analysis will allow to expand the scope of the present study and to draw specific policy conclusions that were not possible with the current sample.

FOOTNOTES

(1) Hours worked can sometimes be an endogenous variable. However, in the case of Cote d'Ivoire, salaried workers rarely are able to determine autonomously and individually their hours of labor supply. Hours thus vary little within each occupation as well as among non-teacher occupations and are introduced in the equation mainly as a characteristic of occupation.

(2) We recognize that the CILSS sample is small. A census is usually preferred to a household survey as data base to do an occupation specific analysis. However, in Cote d'Ivoire available census data are too out of date to warrant current analysis.

(3) Alternative explanations for the significance of a dummy coefficient for diploma include the human capital one that degree earners are more able and therefore more productive than non-degrees earners. This is not likely to be valid here since the dummy coefficient for diploma is significant only in the government sector, where productivity matters the least.

(4) Income differentials between categories represented by dummy variables are calculated by comparing the absolute earnings predicted by the logarithmic functions. For example, the coefficient of sex in equation 2 above is -0.3352; this implies that women's earnings are below men's by exp(0.3352)-1=0.3982% . (See Halvorsen and Palmquist (1980) for more on this).

(5) A reviewer suggested that the survey may have overestimated the hours actually worked by teachers. To further test the role of hours worked we reestimated the equations with all teacher hours diminished by 50% . The hour variable continued to be insignificant and the coefficient of teacher was not significantly different from the the previous ones showing the robustness of the results.

(6) This is supported by the fact that when the earnings equation No 1 of table 2 is reestimated over the subsample of employees with at least 10 years of education, the coefficient of the log of monthly hours worked is statistically insignificant.

(7) It is clear that people are attracted to teaching jobs for non-salary reasons also such as the nature of the work, job security, prestige, etc.. By the same token, policies that would involve cutting salaries might affect not only the supply of new teachers but also the morale and work atmosphere of existing teachers which in turn could affect teaching quality.

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